

REMARKS

Claims 1, 2 and 4-7 are pending. Claims 1 and 2 are subject to examination and claims 4-7 are withdrawn from consideration. No amendments have been made by way of the present submission, thus, no new matter has been added.

Applicants further point out that no new issues have been raised which would require additional search and/or consideration on the part of the Examiner. In the event that the present submission does not place the application into condition for allowance, entry thereof is respectfully requested as placing the application in better form for Appeal.

In view of the following remarks, Applicants respectfully request that the Examiner withdraw all rejections and allow the currently pending claims.

Improper Finality

Applicants respectfully submit that the outstanding Office Action has been made improperly Final. In particular, the Examiner has presented a new grounds of rejection under 35 U.S.C. § 103(a). In the prior Office Action the Examiner rejected claims 1-3 based upon only Konya et al., U.S. Application Publication No. 2003/0103890 (Konya '890). In the Response filed on April 8, 2008, Applicants submitted arguments and amended claim 1 to include subject matter taken from originally filed claim 3. In the present Office Action the Examiner has now rejected claims 1 and 2 based upon Konya '890 in view of two new references, in particular, Menashi, U.S. Patent No. 5,063,179 (Menashi '179) and Murota, U.S. Patent No. 6,677,095 (Murota '095).

The Examiner argues that Applicants' amendment necessitated the new grounds of rejection presented in the Office Action, however, Applicants respectfully submit that this is incorrect. In particular, Applicants simply adopted the subject matter of originally filed claim 3, which was already subject to rejection in the prior Office Action. Had the Examiner believed that the present rejection was appropriate, the rejection should have been presented with respect to claim 3 in the prior Office Action. By now making the new rejection for the first time in a Final Office Action the Examiner is depriving Applicants of the right to file substantive

amendments, if desired, with respect to the rejection. Accordingly, the outstanding Finality is improper and should be withdrawn.

Regardless, Applicants respectfully submit that the newly presented rejection is improper and should be withdrawn.

Issue under 35 U.S.C. § 103(a)

The Examiner has rejected claims 1 and 2 under 35 U.S.C. § 103(a) as being obvious over Konya '890 in view of Menashi '179 and Murota '095. Applicants respectfully traverse this rejection.

Independent claim 1 of the present invention relates to a hydrophobic fumed silica treated with a cyclic dimethylsiloxane, the hydrophobic fumed silica having an M-value representing an oleophilic degree in a range of 48 to 65, a tapping bulk density of larger than 80 g/L but not larger than 130 g/L, and an n-value representing the dispersion of 3.0 to 3.5 as measured in toluene; and wherein a content of aggregated particles of not smaller than 45 µm is not larger than 200 ppm in weight ratio.

In contrast, none of the references cited by the Examiner either suggest or disclose treating the surface to be hydrophobic by the method employed by the present invention. It is therefore apparent that the hydrophobic fumed silica of the present invention having particular properties as recited in claim 1 is never obtained by the references. Thus, the patentability of the present invention cannot be denied by the above references.

Further, as evidence for proving the difference of the present invention from Konya '890, Applicants enclose a Declaration prepared by Mr. Takamuku who is one of the inventors of the present invention. Described below are differences between the present invention and the cited references.

Distinctions Between the Present Invention and the Cited References

(1) As already discussed on the record, the hydrophobic fumed silica of the present invention specified in claim 1 is obtained by:

- (A) Effecting the compressing treatment free of mechanical shearing force prior to treating the fumed silica to be hydrophobic; and
- (B) Feeding a gaseous cyclic dimethylsiloxane after the compressing treatment to bring the cyclic dimethylsiloxane gas into contact with the fumed silica that is compression-treated to render the fumed silica to be hydrophobic (see claim 4).

As a result, the fumed silica has the following properties:

- (a) An M-value is in a range of 48 to 65;
 - (b) A tapping bulk density T_d (g/L) is in a range of $80 < T_d \leq 130$;
 - (c) An n-value is in a range of 3.0 to 3.5 as measured in toluene;
- and
- (d) The content of aggregated particles having sizes of not smaller than 45 μm is not larger than 200 ppm (see claim 1).

(2) In contrast, Konya '890 discloses a hydrophobic silica powder having an aerated bulk density in a range of 100 to 300 g, a primary particle size in a range of 10 to 120 nm and a hydrophobic degree in a range of 40 to 80 as measured by methanol titration. Konya '890 further discloses obtaining the hydrophobic silica powder by treating a hydrophilic silica powder obtained by a gaseous phase method with a cyclic siloxane to impart hydrophobic property thereto.

The Examiner has taken the position that although there is no description concerning the M-value, n-value or tapping bulk density, the hydrophobic silica of Konya '890 is obtained by (a) treatment that imparts a hydrophobic property by using the same hydrophobic property-imparting agent (cyclic dimethylsiloxane) similar to that of the present invention. Further, Konya '890 has fine particle sizes, a predetermined hydrophobic degree and an aerated bulk density that is increased by compressing treatment and, therefore,

has the same properties as those of the present invention. The Examiner further takes the position that the tapping bulk density which lies outside the range of the present invention can be adjusted to be a tapping bulk density like that of the present invention by suitably varying the conditions of the compressing treatment. Applicants strongly disagree.

Konya '890 is quite different from the present invention in that the compressing treatment is conducted by using a ball mill. That is, if the compressing treatment is conducted by means which is accompanied by a mechanical shearing force, such as a ball mill, the particles aggregate together. Therefore, even if the particles may have a small primary particle size, aggregated particles are greatly formed and are dispersed to only a small degree in the resin. This makes it quite difficult to obtain a hydrophobic silica powder having an M-value and an n-value specified by the present invention as described in the present specification, page 3 line 26 to page 4, line 11 and Comparative Examples 4 and 5.

Further, according to Konya '890 the starting silica and the hydrophobic property-imparting agent (cyclic dimethylsiloxane) are mixed together prior to the compressing treatment by using a ball mill. It is therefore clear that the particles tend to be aggregated together more conspicuously due to hydrogen bonding, and the obtained hydrophobic silica is dispersed to only a small degree in the resin as compared to the present invention.

Konya '890 teaches using the cyclic dimethylsiloxane as a hydrophobic property-imparting agent but brings the liquid hydrophobic property-imparting agent into contact with the fumed silica. This differs from a hydrophobic property-imparting treatment achieved by bringing the gaseous cyclic dimethylsiloxane into contact therewith. That is, the cyclic dimethylsiloxane has no SiOH group and, therefore, the hydrophobic property-imparting treatment is not conducted even if the liquid is simply brought into contact unless the treatment is conducted by using an accelerator such as ammonia or amine. Further, even by using an accelerator the treatment must be conducted at a considerably high temperature. Further, since the compressing treatment is effected by using a ball mill, a hydrophobic fumed silica that excellently disperses in the resin (like that of the present invention) is not

obtained even if the accelerator is used. According to the present invention, the cyclic dimethylsiloxane is brought into contact in a gaseous form and the hydrophobic property is imparted to a sufficient degree even without using an accelerator. This makes it possible to obtain a hydrophobic fumed silica that excellently disperses in the resin as per the present invention.

As described above, the hydrophobic fumed silica of the present invention is obtained by a method which is quite different from the method disclosed by Konya '890. Therefore, the silica of Konya '890 does not have the above-mentioned properties specified by the present claims. This fact has been clearly demonstrated in the attached Declaration. For instance, the Declaration uses, in Comparative Experiments 1-3, an octadimethylsiloxane as the cyclic siloxane, and executes the hydrophobic property-imparting treatment and the compressing treatment in the same manner as in Example 1 of Konya '890.

According to Konya '890, as will be understood from the results of these Experiments, the compressing treatment is effected by using the ball mill and, therefore, the particles aggregate together due to the mechanical shearing force. In each of Comparative Experiments 1-3, for example, the content of aggregated particles of not smaller than 45 μm is far exceeding 200 ppm. The M-value may be obtained in a range as specified by the present invention (Comparative Experiments 2 and 3) but the n-value is smaller than that of the present invention. Besides, the dispersion in the resin or in an oily matrix such as silicone oil is low as compared to the present invention. As demonstrated in Comparative Experiment 3, further, the tapping bulk density can be adjusted to lie in the range specified by the present invention by varying the conditions for compressing treatment by using the ball mill. In this case, too, however, the particles are too aggregated, and the n-value is low.

As described above, the hydrophobic fumed silica of the present invention is not obtained by the technology disclosed by Konya '890. Therefore, the Konya '890 is completely deficient in teaching the present invention. The secondary references cannot cure these deficiencies.

(3) For instance, Menashi '179 simply discloses fumed silica of high purity containing little impurities but completely fails to disclose or suggest the hydrophobic property-imparting treating method for obtaining the hydrophobic fumed silica of the present invention. Therefore, the present invention cannot be expected even if the Menashi '179 reference is combined with Konya '890.

(4) Further, Murota '095 discloses hydrophobic fumed silica which is treated to be hydrophobic and has a distribution of fine particle sizes. However, the hydrophobic fumed silica is treated to be hydrophobic by bringing a hydrophobic property-imparting agent such as polyorganosiloxane or trialkoxysilane in a liquid form into contact with the fumed silica. This is performed without using the cyclic dimethylsiloxane as the hydrophobic property-imparting agent or without bringing the hydrophobic property-imparting agent in a gaseous form into contact with the fumed silica. Murota '095 further discloses in its Example 3 an attempt to increase the bulk density by a compressing treatment. Like Konya '890, however, the compressing treatment is conducted by using a ball mill. As described above, the hydrophobic property-imparting treatment is conducted by a method quite different from that of the present invention and, therefore, properties like those of the present invention cannot be achieved.

Applicants further note that the examples of Murota '095 disclose a hydrophobic fumed silica that excellently disperses in a toner and, therefore, the Examiner may be considering that Murota '095 too has an M-value and an n-value similar to those of the present invention. According to Murota '095, which effects the compression treatment accompanied by the mechanical shearing force like in Konya '890, however, the particles are conspicuously aggregated as compared to the present invention, and the content of aggregated particles of sizes of not smaller than 45 μm exceeds 200 ppm as demonstrated in the attached Declaration. As a result, it is not possible that the M-value and the n-value both lie in the ranges specified by the present invention.

In Example 3 of Murota '095, for example, the hydrophobic fumed silica has a peak in the aggregated particles of 3.0 μm from which it can be understood that the particles are conspicuously aggregated due to the compression that is accompanied by mechanical shearing force. In fact, the hydrophobic fumed silica of Murota '095 has a bulk density of as large as 130 g/l. The peak of aggregated particles does not mean that the content of aggregated particles of sizes of not smaller than 45 μm is not larger than 200 ppm. That is, Example 1 of Murota '095 discloses the hydrophobic fumed silica having a peak in the similar aggregated particles. However, there has been clarified that 70% of the whole volume of the aggregated particles is included in a range of 0.1 to 10 μm meaning that the aggregated particles larger than 10 μm are contained in an amount as large as about 30% (it is not considered that fine particles of smaller than 0.1 μm are present in large amounts). From the above, it is understood that the hydrophobic fumed silica of Example 3 contains the aggregated particles of sizes of not smaller than 45 μm in amounts larger than 200 ppm.

As described above, the hydrophobic fumed silica of Murota '095 also contains the aggregated particles in large amounts and is, therefore, considered to disperse to only a small degree in the resin and has a M-value and a n-value in ranges lower than the present invention. Murota '095 describes that the dispersion in the toner is favorable and it appears the Examiner is considering that the hydrophobic fumed silica of Murota '095 also has a M-value and a n-value lying in the same ranges as those of the present invention, which, however, is incorrect. This is because the hydrophobic fumed silica of Murota 095 is externally added to the toner but is not dispersed in the matrix such as a resin. That is, Murota '095 merely teaches that the hydrophobic fumed silica can be evenly adhered to the surfaces of the toner particles.

Further, according to Murota '095 the hydrophobic property-imparting treatment is effected by bringing a liquid hydrophobic property-imparting agent into contact but without using an accelerator such as ammonia or amine. It is not, therefore, considered that the hydrophobic property-imparting treatment is effected to such a degree that the M-value and the n-value reach the same levels as those of the

present invention.

As described above, it is apparent that Murota '095 fails to disclose a hydrophobic fumed silica having properties like those of the present invention. Accordingly, the present invention could not have been obvious even from a combination of Murota '095 with Konya '890.

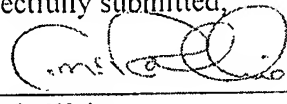
Based upon the above, Applicants respectfully submit that even when the disclosure of each reference is combined, the present invention cannot result. The Examiner is therefore respectfully requested to withdraw this rejection and allow the currently pending claims.

If the Examiner has any questions or comments, please contact Craig A. McRobbie, Reg. No. 42,874, at the office of Birch, Stewart, Kolasch & Birch, LLP.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

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Attachment: Declaration under 37 C.F.R. § 1.132